International Petroleum Technology Conference
Climate Change and Environment

Managing Long-term Climate Risks

Dr. Brian P. Flannery
Exxon Mobil Corporation

Kuala Lumpur, Malaysia
December 3, 2008

Twin International Energy Challenges

- **Meeting significant increase in energy demand and improving access to energy**
- **Responding to GHG risks**

Context (IEA):

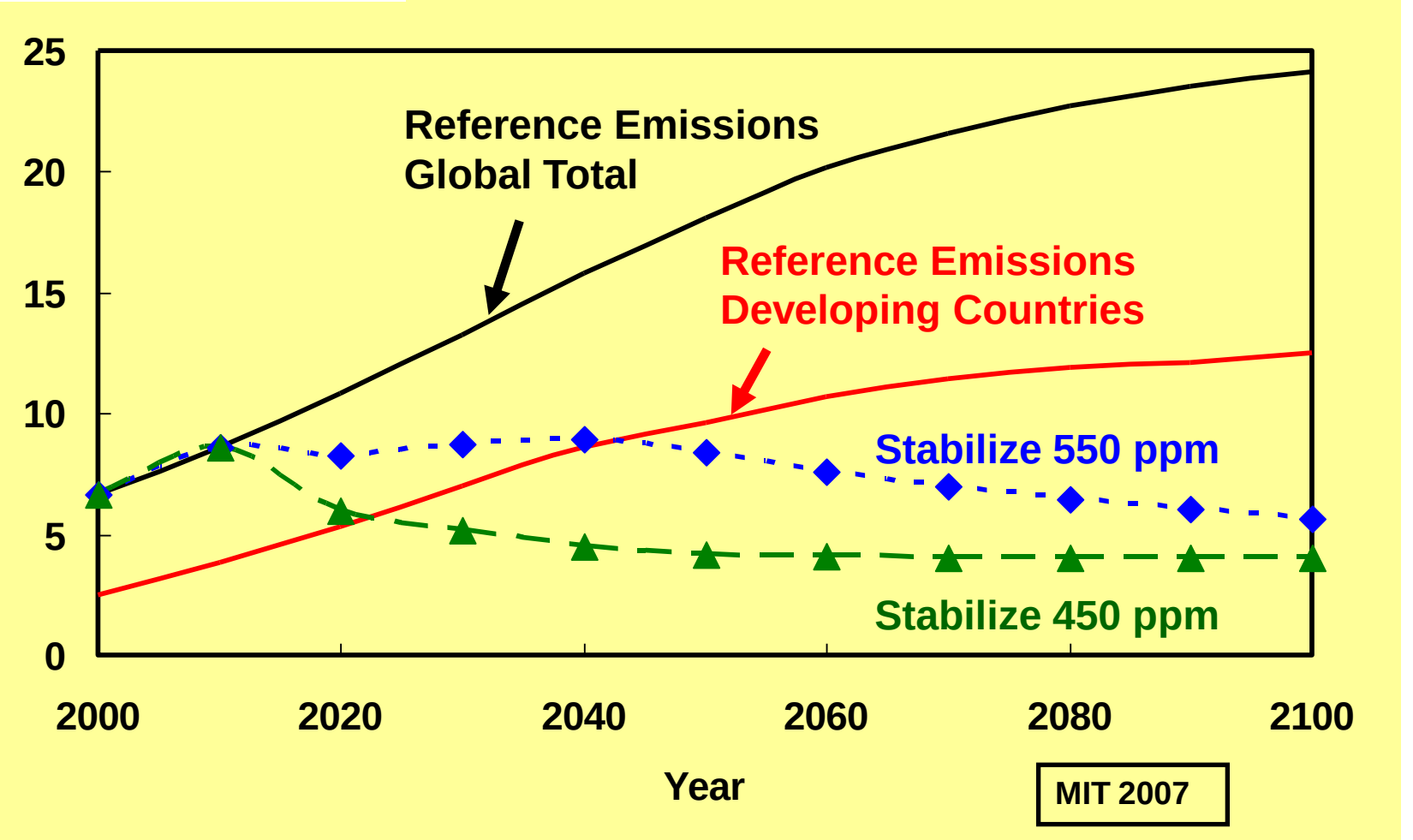
2B	**People without access to commercial energy**
$22T	**Investment (through 2030) energy supply and distribution**
$45T	**Investment (through 2050) for 50% cut in global GHG emissions**

Accelerated development and deployment of advanced technology will be essential to meet aspirations and manage risks at affordable costs

Deployment will occur globally in thousands of multi-billion dollar investment projects for currently non-commercial technologies

Stabilization Requires Global Participation

Emissions (GtC/year)



Mitigation cost estimates are sensitive to assumptions about future policy in developed and developing countries

Managing Long-term Climate Risks

- **Build capacity to create technology options:**
  - Education
  - Technology R&D

- **Deploy advanced, low-GHG technologies:**
  - Policy framework for mitigation
  - Effective and timely creation of
    + Regulatory frameworks
    + Public and private infrastructure
  - Enabling frameworks for
    + Trade
    + Investment and technology transfer

- **Maximize international cooperation in an evolving mosaic of national and regional policy regimes**

Policies to address climate risks will require decades of effort and will need to be flexible to incorporate learnings about climate science, new technologies, and policy approaches.

Policy Framework for Managing Climate Risks

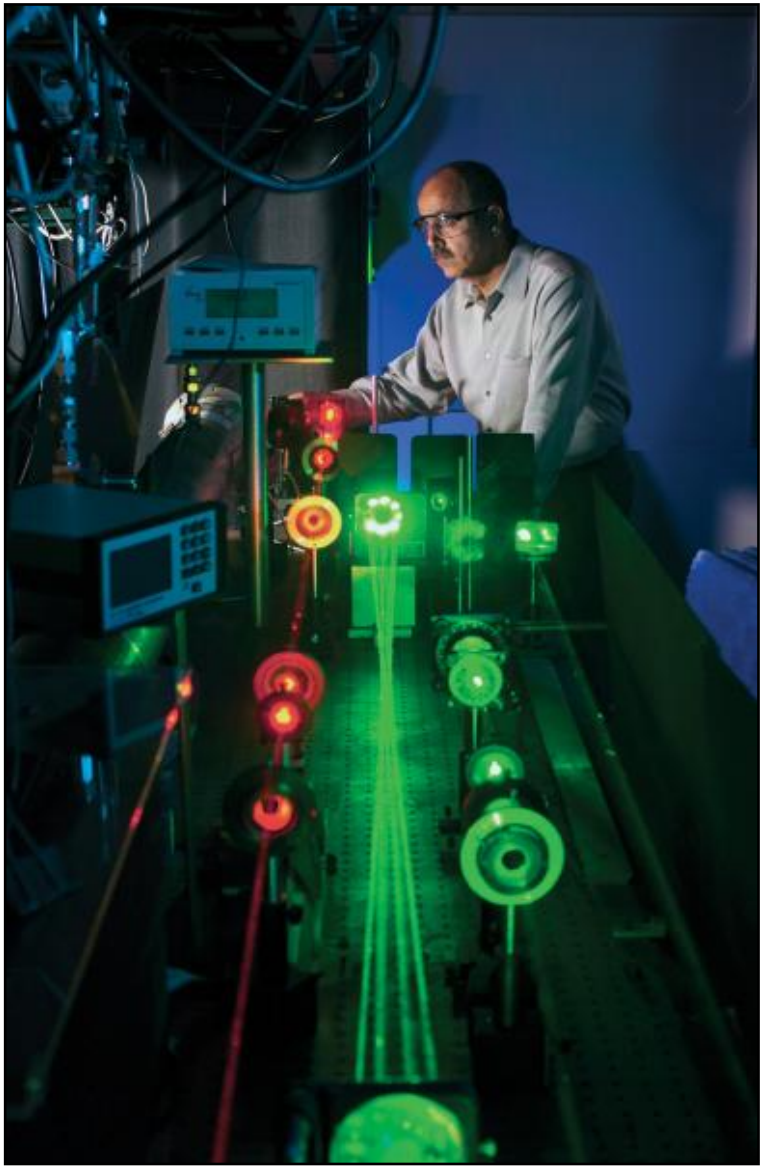
- **Long-term objective:**
  - Reduce risk of serious impacts at reasonable cost to society
- **Near-term objectives:**
  - Promote energy efficiency
  - Promote deployment of existing technologies that reduce GHG emissions
  - Support research and development of low-GHG technologies
  - Support climate research to reduce uncertainties and pace response

ExxonMobil Policy Principles

- **Ensure any cost of carbon is uniform across the economy and predictable**
- **Maximize use of markets**
- **Promote global participation**
  - Consider priorities of developing world
  - Recognize impacts of imbalances among national policies
- **Minimize complexity to reduce administrative costs**
- **Maximize transparency to companies and consumers**
- **Adjust in the future to developments in climate science and the economic impacts of climate policies**

ExxonMobil Actions

- **GHG measurement and reporting**
- **Reducing operational emissions**
  - Energy efficiency
  - Cogeneration
  - Flare reduction
- **Public and proprietary research**
  - Energy efficiency
  - Advanced vehicle/fuels
  - Hydrogen production
  - Carbon capture and storage
  - Gasification
- **Climate research sponsored at leading institutions (for 25+ years)**
- **EM scientists participate in IPCC and national assessment activities**
  - 80+ climate papers in professional journals



The Global Climate and Energy Project

Mission

- Fundamental and pre-commercial research
- Novel technology options for energy conversion and utilization
- Impact in the 10-50 year timeframe

Strategy

- No incremental research: revisit fundamentals and explore new approaches
- High risk / high reward

Participants

- Academia: Stanford and research institutions in Australia, Europe, Japan, USA
- Global Industrial Leaders

Status

- 40+ programs: renewables, carbon capture and storage, hydrogen, advanced combustion, ...
- Involving over
  - 225 Students and post-docs
  - 80 Faculty at Stanford & 9 other institutions

Thank You